

RENEWABLE ENERGY

Medium-Term Market Report 2016

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Launch Presentation

Market Analysis and Forecasts to 2021

Singapore International Energy Week, Singapore, 25 October 2016

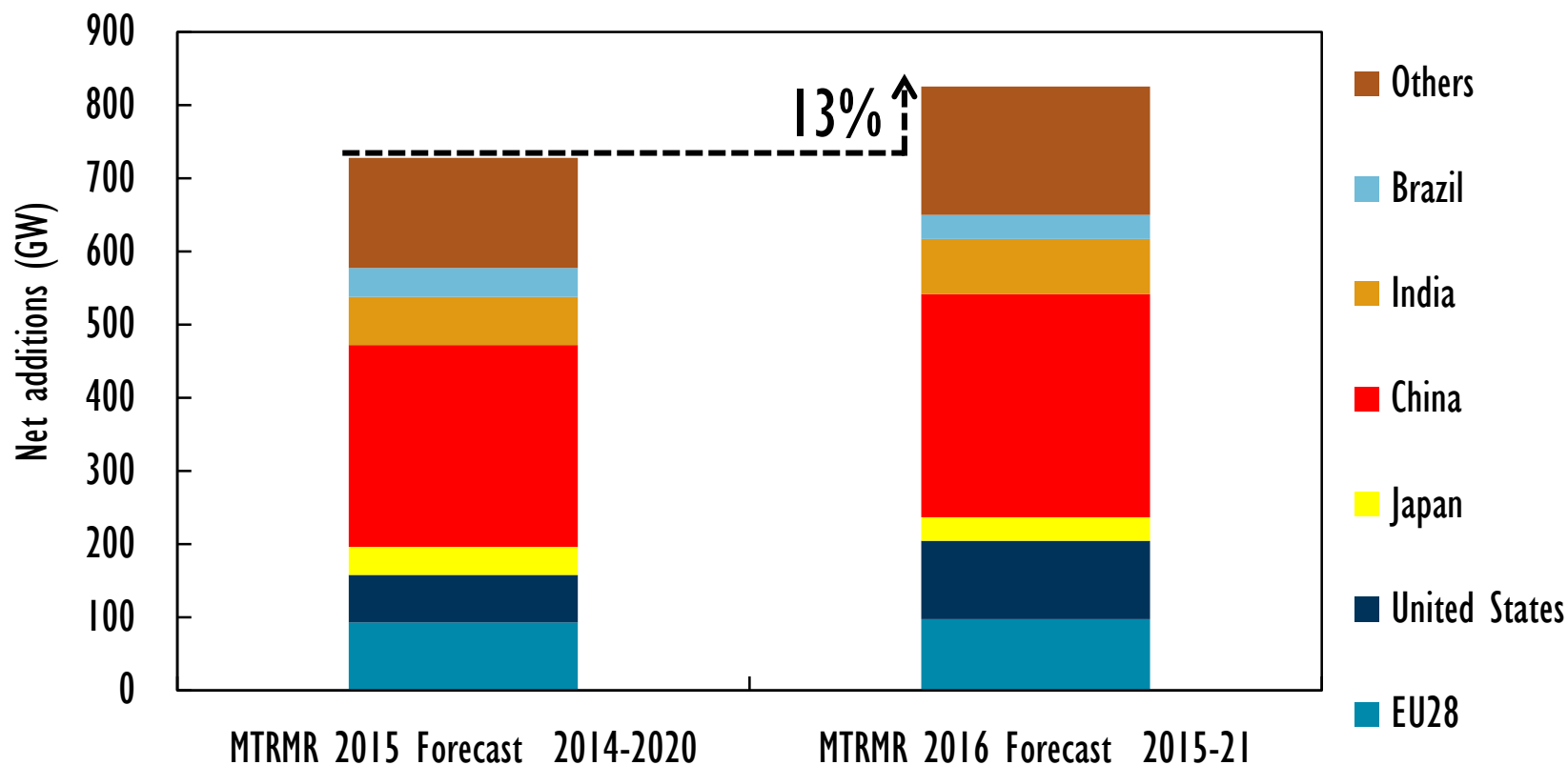
Context



- **A year of records for renewable electricity**
 - *A record amount of new capacity was installed in 2015*
 - *Total capacity has now overtaken coal*
- **COP21 Paris Agreement gives momentum to renewables**
- **Local air pollution & energy security are also key drivers**
- **Energy investment flows confirm shift to renewables**
- **But policy makers need to heighten their commitments and provide investors more clarity & certainty**

New policies underpin a more bullish forecast for renewables

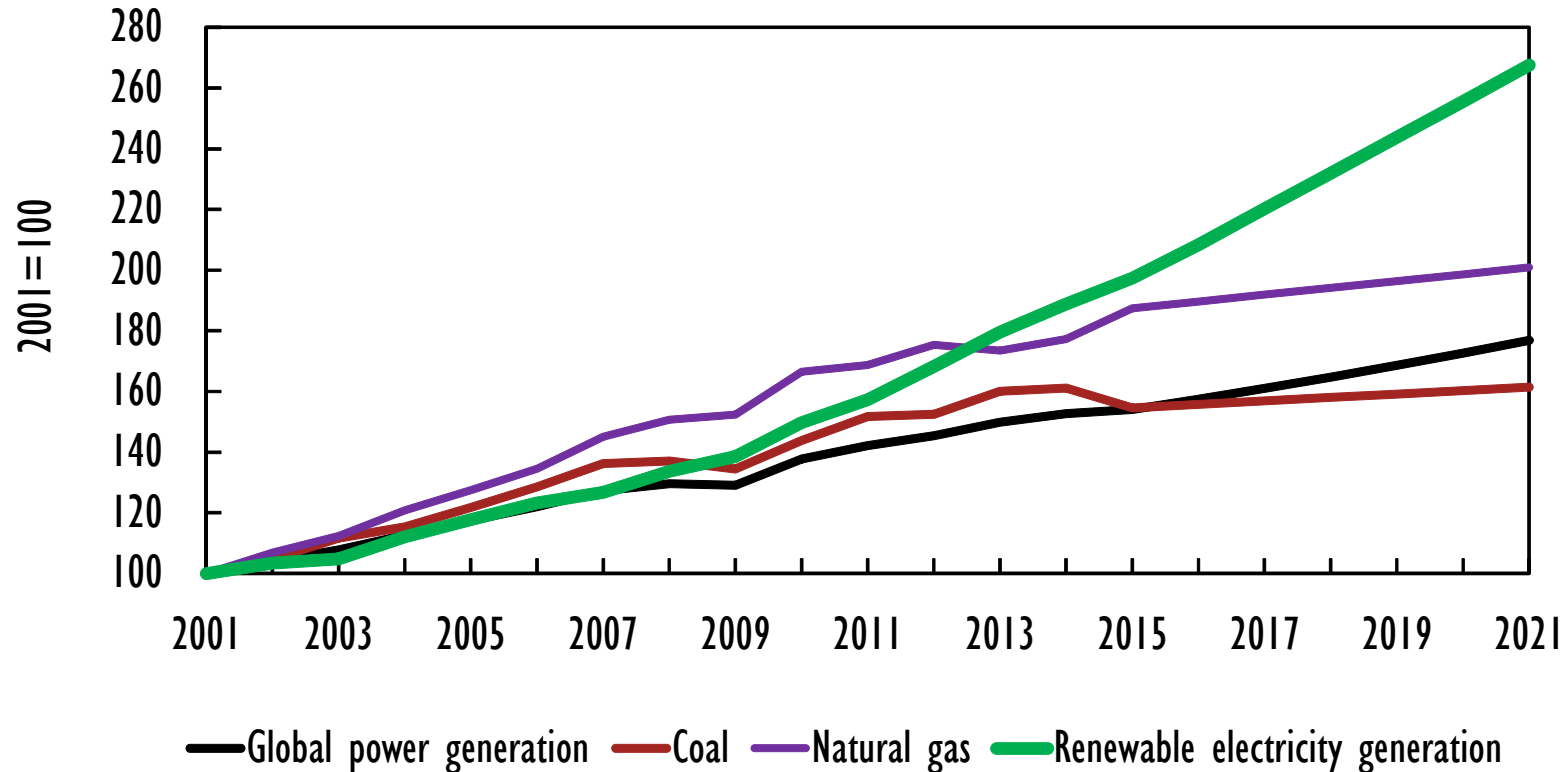
Renewable electricity capacity growth (GW) in *MTRMR's main case*



China remains key growth market for renewable capacity, while the United States surpasses the EU for the first time

Renewables to remain fastest growing source of electricity generation

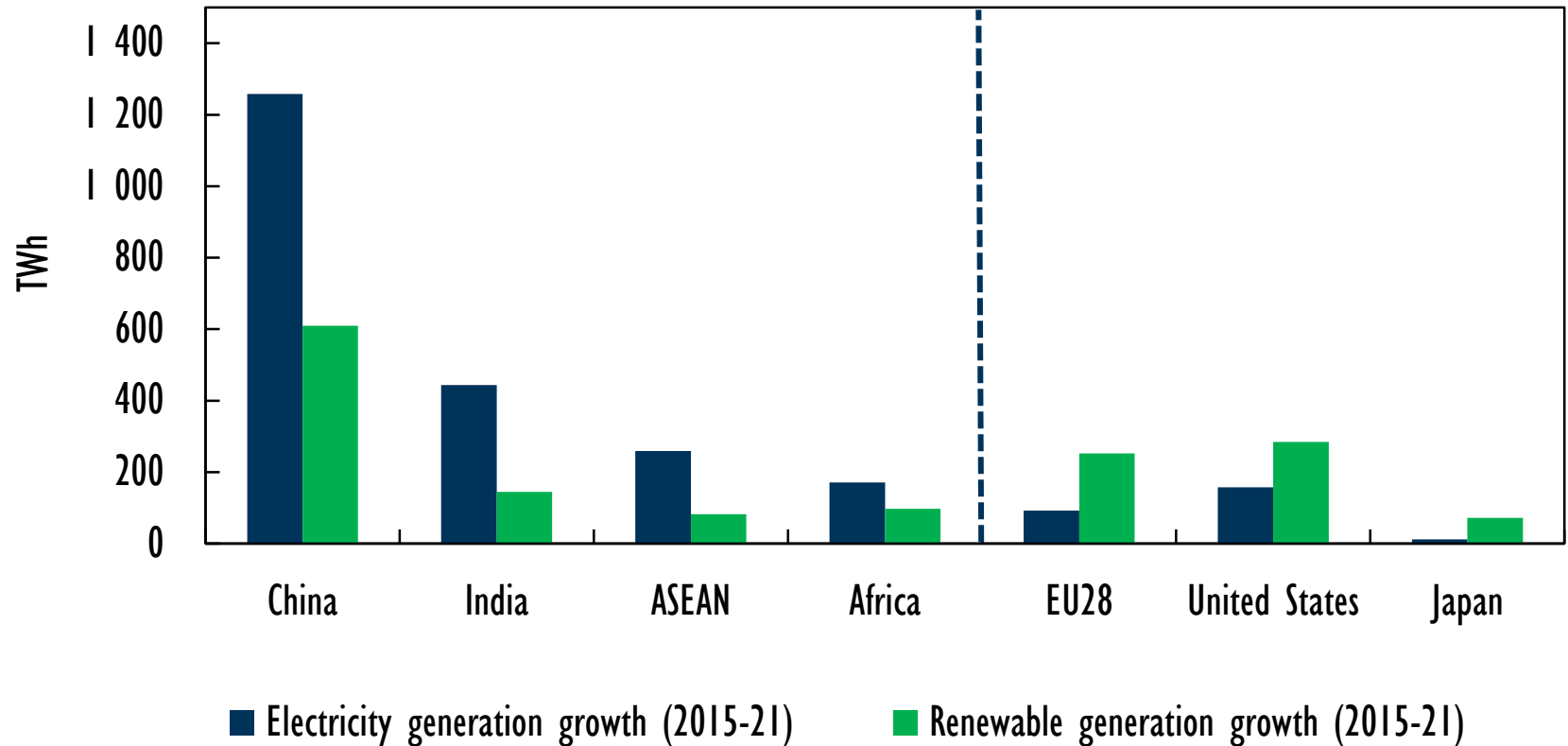
Indexed electricity generation by fuel (2001-21)



Generation from renewables to rise by almost two-fifths over 2015-2021, pushing their share of total electricity generation from 23% to 28%

A two-speed world for renewable electricity

Electricity and renewable generation growth by country/region

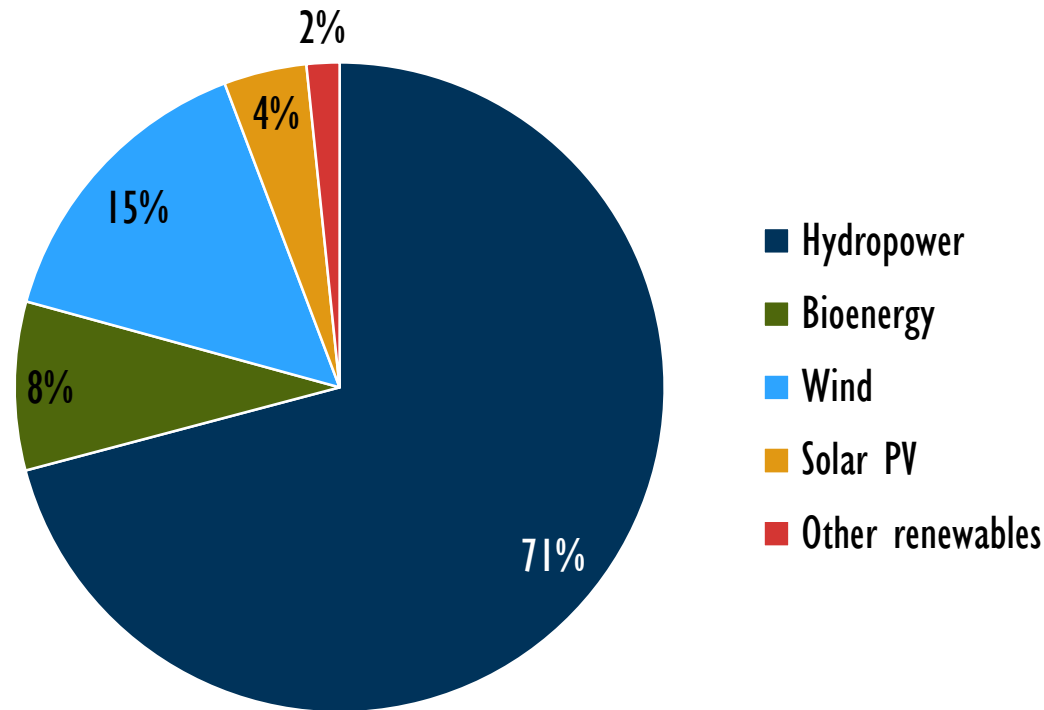


Source: Total electricity generation from World Energy Outlook 2016, forthcoming.

The increase in generation from renewables in 2015-2021 represents 60% of the global increase in electricity output, but prospects vary across regionally

Wind and solar PV compensate for slower hydropower growth

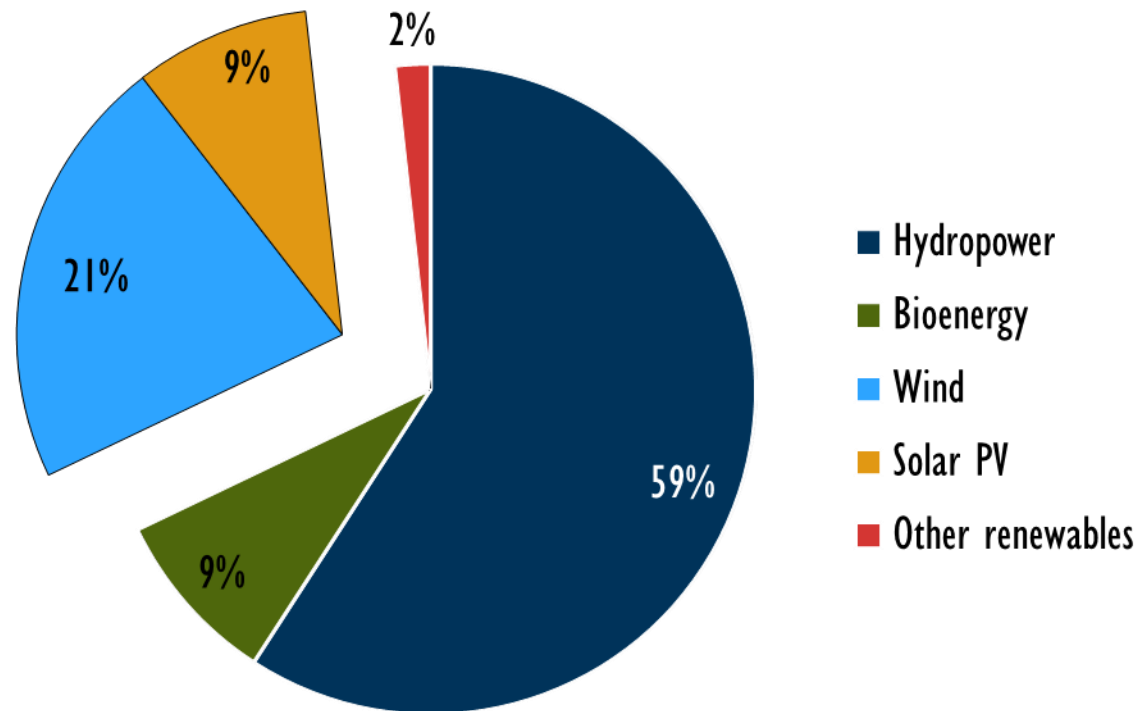
Renewable electricity generation by source 2015



Solar PV & wind account for almost 2/3 of rise in renewables generation; total renewable electricity overpasses 7600 TWh by 2021, equivalent to EU+US today

Wind and solar PV compensate for slower hydropower growth

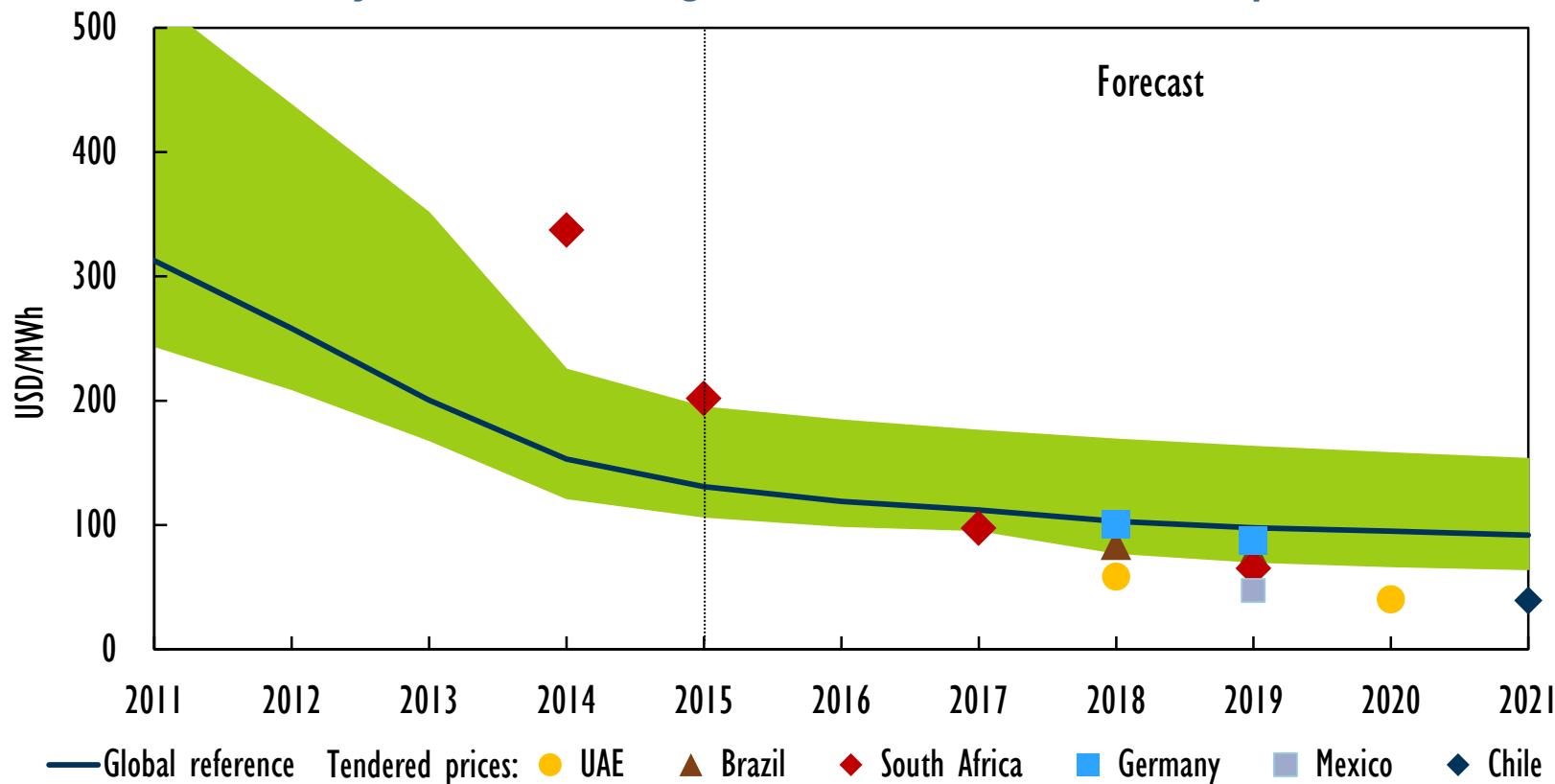
Renewable electricity generation by source 2021



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Solar PV costs continue to decline with increasing competition

Utility-scale solar PV generation cost and contract prices



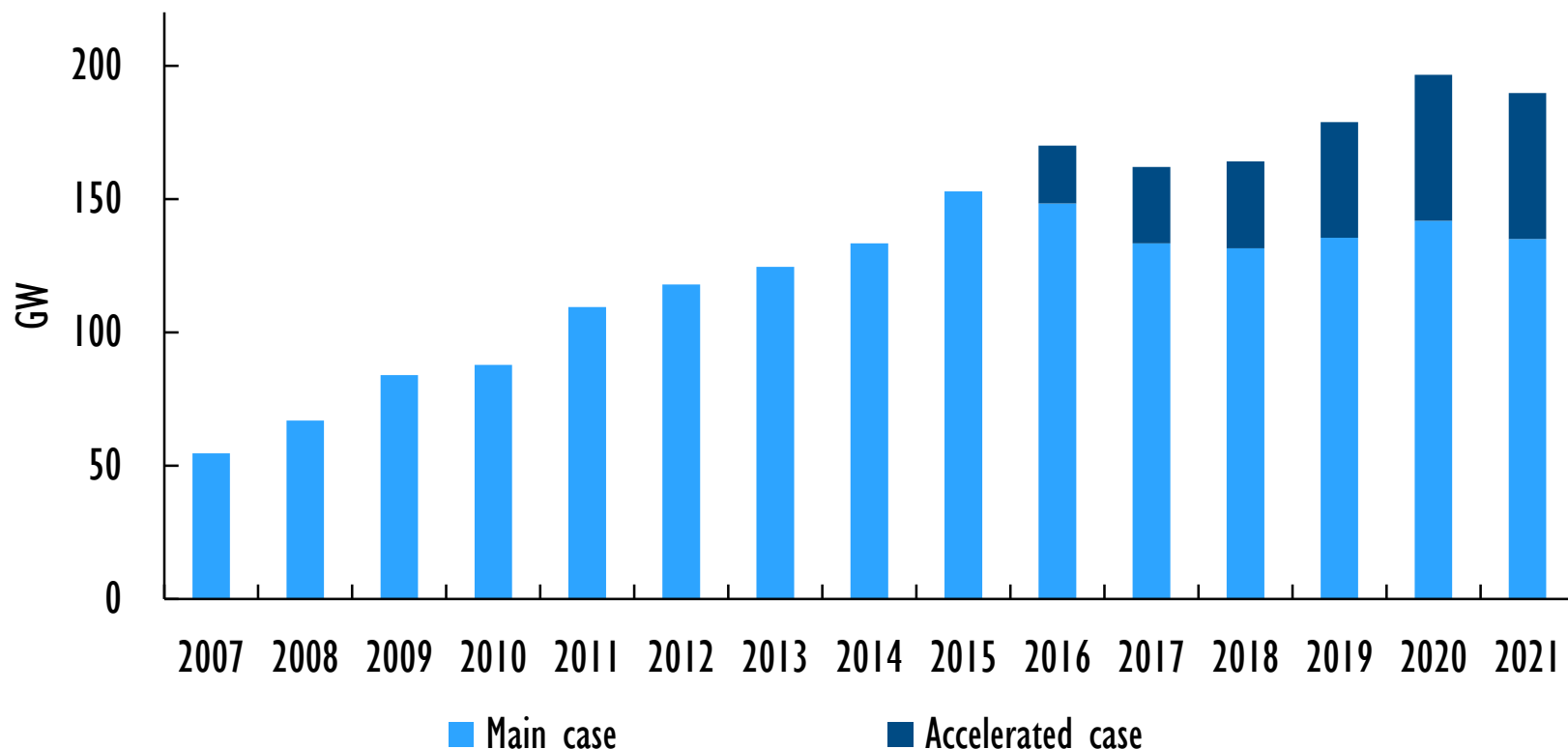
**Utility-scale solar PV generation costs to fall by another quarter over 2015-21;
competitive tenders may result in even faster cost reductions**

More ambitious policies could further enhance the outlook in line 2°C target

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Renewable electricity capacity additions in Accelerated Case vs. Main Case



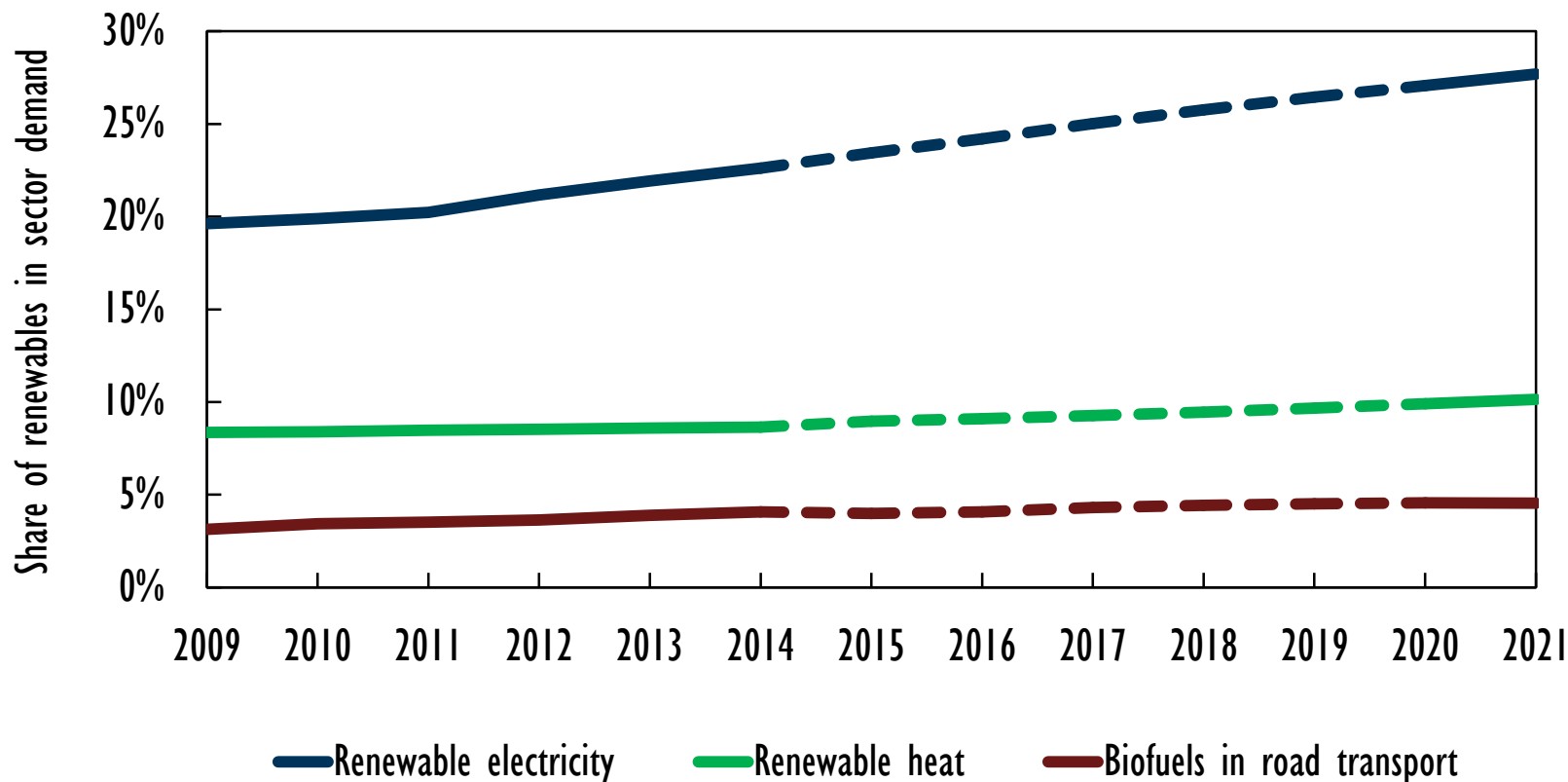
Renewables are in line with NDC pledges by 2030 but reducing policy uncertainty and overcoming financing & grid integration challenges remain key to achieve 2°C target

Renewables to dominate electricity growth, but less progress in heat and transport

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Share of renewables in electricity, heat and transport sectors



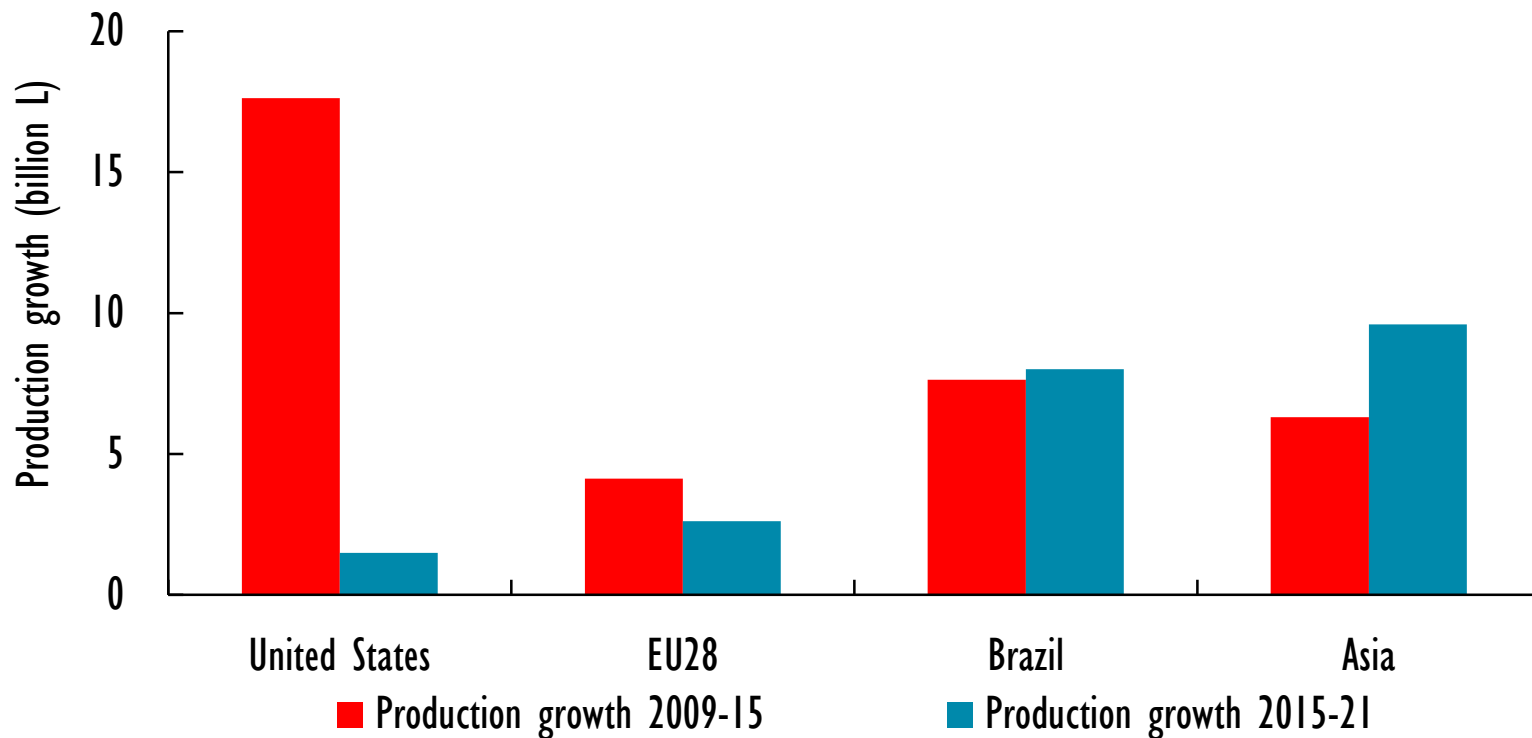
The share of renewables rises in all sectors, despite persistent challenges in heat & transport; interactions between energy efficiency & renewables become critical

Biofuel production shifts to Asia, as EU and US slows

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Biofuels production growth (billion litres)



Structural challenges in the US & policy uncertainty post-2020 in the EU slow growth; Thailand, India & Indonesia have strengthened policies despite low oil prices

Conclusions

- **Prospects for renewables electricity revised upwards, driven by policy improvements, cost reductions & efforts to improve air quality.**
- **The impact of lower fossil fuel prices on renewables varies by sector. Wind (onshore) & solar PV are the only technologies on track for a 2°C scenario.**
- **Competition in Asia between renewables & coal/gas will be critical to meeting global decarbonisation targets.**
- **Attracting investment in renewables hinges on appropriate market rules & regulations, particularly in markets with slow electricity demand growth.**
- **IEA is working to accelerate energy transition with its analysis on policy & technology and system integration of renewables.**